

Puccinellia howellii (POACEAE),
A NEW SPECIES FROM CALIFORNIA

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ABSTRACT

Puccinellia howellii, a new species from the Trinity Mountains of California, is described. As is typical of the genus, this species occurs in mineralized soils, in this case in a series of mineralized seeps; it is known only from the type locality. The new species is morphologically similar to *P. pumila*, a species of coastal habitats.

In April 1954, John Thomas Howell and Lewis S. Rose visited a mineralized seepage area in the Trinity Mountains, west of Whiskeytown, Shasta County, CA, and collected an unusual *Puccinellia*. Observing that plants from this site could not be assigned readily to any previously described species, Howell brought his collection to the attention of Jason Swallen, of the Smithsonian Institution (correspondence attached to Howell specimen at CAS). Swallen agreed that the plants were "curious," but neither he nor Howell subsequently described a new taxon. In the course of my studies of *Puccinellia*, I too have found the plants of the Whiskeytown population curious; they are distinct and warrant taxonomic recognition. In describing this species I honor the collector who first drew attention to its unique nature.

Puccinellia howellii Davis, sp. nov. (Fig. 1). — TYPE: USA, California, Shasta Co., Whiskeytown–Shasta–Trinity National Recreation Area, Whiskeytown Unit, ca. 0.8 mi W of Tower House, N side of Willow Creek at junction of Cal. Hwy. 299 with Crystal Creek Road, elev. ca. 500 m, 26 Jul 1988, *Davis 526* (holotype, BH: isotypes, CAS, NY, US).

Herba perennis, caespitosa, non stolonifera. Caules floriferi 7–40 cm alti. Ligula membranacea, 1.5–2.7 mm longa; lamina involuta, 1.4–2.2 mm lata ubi complanata. Paniculae 2–13 cm longae; rami infimi erecti vel expansi vel horizontales tempore florendi, vel reflexi tempore fructificandi; pedicelli glabri, vel subglabri, scabrelli remote. Gluma prima 0.8–1.9 mm longa, gluma secunda 1.7–2.5 mm longa; lemmata (1–)2–5, lemma primum 2.4–3.3 mm longum.

P. pumilae (Vasey) A. Hitchc. affinis, imprimis marginibus lemmatum apices versus scaberulo-serrulatis (non integris nec subintegris), et antheris 1.5–2.0 mm longis (non 0.5–1.0 mm) diversa.

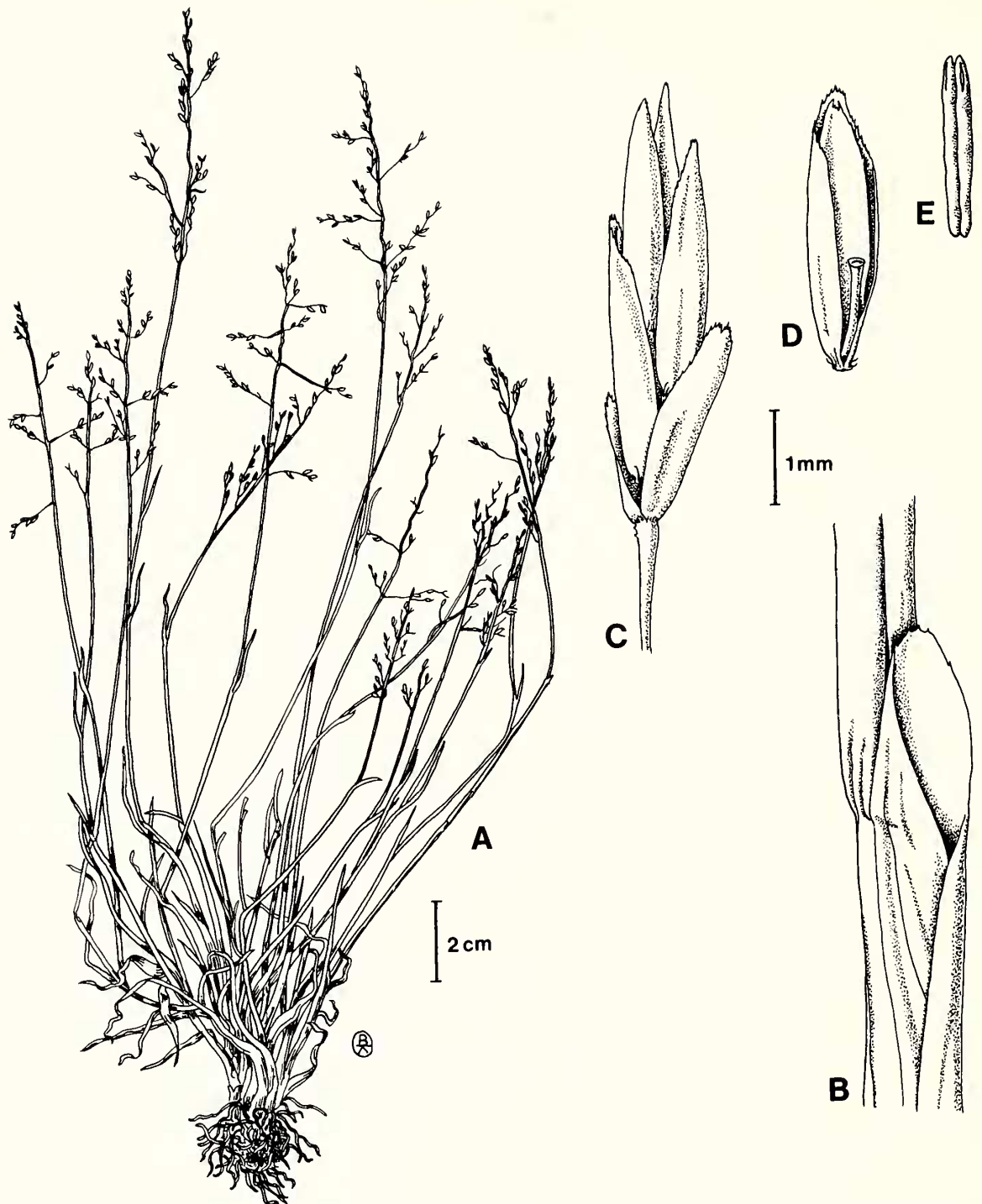


FIG. 1. *Puccinellia howellii* (drawn from Davis 526 [BH]; 2 cm scale applies to A, 1 mm scale to B-E). A. Habit. B. Ligule with associated sections of sheath and blade. C. Spikelet with apex of pedicel. D. Lower floret with rachilla segment. E. Anther of lower floret, partially dehiscent.

Perennial, caespitose, nonstoloniferous herb. Flowering stems ascending to erect, 7–40 cm tall. Leaves basal and cauline; sheath open nearly to base; ligule of cauline leaf membranous, 1.5–2.7 mm long, apex obtuse, margin entire or minutely and irregularly serrate near apex, abaxial surface glabrous to sparsely scabrous near apex, adaxial surface glabrous; blade involute, 1.4–2.2 mm wide when unrolled. Panicles 2–13 cm long, lower branches erect to horizontal at anthesis

and erect to reflexed in fruit, upper branches erect to ascending in flower and in fruit, ultimate branches and pedicels glabrous, or subglabrous with a few scattered scabrules. Spikelets 3.0–7.5 mm long, with (1–)2–5 florets; glumes ovate, usually convex (occasionally keeled), light green to straw brown, often tinged with purple, often banded subapically with yellow near margin, apices acute to obtuse, margins entire below, minutely and uniformly scabrous-serrate near apices, nerves obscure, not converging apically, abaxial surfaces glabrous; first glume 0.8–1.9 mm long, 1-nerved; second glume 1.7–2.5 mm long, (1–)3-nerved; lemmas ovate to elliptic, usually convex (occasionally weakly keeled apically), light green to straw brown, usually tinged with purple, often banded subapically with yellow near margin, apex acute to obtuse, margin entire below, minutely and uniformly scabrous-serrate near apex, nerves 5, obscure, not converging apically, abaxial surface glabrous, or subglabrous with a few hairs near base of lemma, hairs mostly on nerves; lower lemma 2.4–3.3 mm long; palea subequal to lemma, keels 2, glabrous below, glabrous or scabrous near apex. Anthers of lower floret 3, 1.5–2.0 mm long. Caryopses ovoid, tawny to olive green, 1.5–2.0 mm long; embryo 0.4–0.6 mm long.

Paratypes. USA, California, Shasta Co. (all from the same locality as the type): 26 Apr 1954, *J. T. Howell 29177* (CAS [2 sheets], GH, NY, US); 26 Apr 1954, *Rose 54028* (CAS, DS, GH, NY, RSA, WS, WTU); 14 June 1955, *Howell 30423* (CAS); 24 Jun 1987, *Martz s.n.* (CAS); 14 Jun 1988, *Martz 274* (AHUC, BH, CAS, DAV, HSC, RSA, UC).

Puccinellia howellii has been collected in flower during April and June, and in fruit during June and July. The holotype bears both mature fruits and dehisced anthers.

Among described species of *Puccinellia*, *P. howellii* resembles *P. pumila* most closely. The latter species was not mentioned by Munz (1959), and specimens of *P. howellii* and *P. pumila* key in Munz's flora to *P. airoides* (Nutt.) S. Watson & J. Coulter (= *P. nuttalliana* (Schultes) A. Hitchc.), *P. grandis* Swallen (= *P. nutkaensis* (J. S. Presl) Fern. & Weath.), or *P. lemmonii* (Vasey) Scribner. *Puccinellia howellii* and *P. pumila* differ from other species of *Puccinellia* occurring in California in their combination of the following three characters: 1) perennial habit; 2) pedicels glabrous, or subglabrous with a few scattered scabrules (vs. uniformly scabrous, as in *P. distans* (Jacq.) Parl., *P. lemmonii*, *P. nutkaensis*, and *P. nuttalliana*); and 3) keels of the palea glabrous along the lower half (vs. scabrous to scabrous-hispid along the lower half, as in *P. maritima* (Hudson) Parl.). *Puccinellia howellii* differs from *P. pumila* in 1) margin of the lemma near the apex (minutely and uniformly scabrous-serrate in *P. howellii*, entire, or subentire with a few scattered scabrules in *P. pumila*);

and 2) anther length (1.5–2.0 mm in *P. howellii*, 0.5–1.0 mm in *P. pumila*).

Puccinellia howellii is known only from the type locality, where it is a dominant element of the vegetation in a series of mineralized seeps, the water from which ranges in conductivity up to 28,000 $\mu\text{mho}/\text{cm}^2$, and in Cl^- concentration up to 10.8 g/liter, the cation content principally Na^+ (C. Martz, California Dept. of Transportation, pers. comm.). At this site, *P. howellii* occurs in association with other species characteristic of saline and otherwise mineralized soils, including *Juncus bufonius* L., *Spergularia marina* (L.) Griseb., and *Triglochin maritima* L. Most species of *Puccinellia* are endemic to such soils, and most occur either in coastal or in inland sites of this nature (cf. Fernald and Weatherby 1916; Hughes and Halliday 1980; Sørensen 1968; Swallen 1944; Tsvelev 1983). Thus, the habitat of *P. howellii* is not unusual. Notably, the closely related *P. pumila* occurs only in coastal habitats. In California it has been collected in Humboldt Co. (mouth of Eel River, Tracy 16073 [RM, UC, WTU], Rogers 220 [WTU]; Humboldt Bay, Rogers 219 [WTU]), ca. 80 mi from the known population of *P. howellii*.

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